

4. DESCRIPTION OF TWO NEW SPECIES OF PINNA.
 BY SYLVANUS HANLEY, F.L.S., ETC.

1. PINNA CHEMNITZII. *P. testa magna, subventricosa, oliacea, carinæ centralis experte, costis (circiter 14) angustis rotundatis et plerumque muticis ornata; ventrali triente fere lævigato, juxta umbones solum oblique pauciplicato: margine dorsali valde incurvato, plerumque squamis pectinato: extremitate postica lata, subtruncata, inferne subrotundata: margine ventrali postice cum margine dorsali parallelo, antice abrupte ascendente.*

Long. 5 pol., lat. 12 pol. et supra.

Hab. Insulæ Philippinæ (Cuming).

Mus. Hanley, Cuming.

Chemnitz has very fairly delineated (Conch. Cab. f. 770) this species as the *pectinata* of Linnæus, to which shell, indeed, it bears much resemblance. A few raised striæ succeed the distant ribs.

2. PINNA RUMPHII. *P. testu haud magna, subtrigona, incurvato-cuneiformi, nitida, cornea, in medio carinata, obsolete costata (costis muticis angustis postice evanidis), postice sublævigata, marginem ventralem versus late et oblique plicata: margine dorsali inermi, et valde incurvato; ventrali sinuato: extremitate postica inferne subrotundata.*

Long. 3 pol., lat. $6\frac{1}{2}$ pol.

Hab. Insulæ Moluccæ.

Mus. Hanley, Cuming.

In the forty-sixth plate (figures I, K) of his 'Thesaurus,' Rumphius has very clearly indicated this somewhat scarce *Pinna*, which exhibits such peculiar characteristics as to render its determination an easy process.

5. PROPOSAL TO SEPARATE THE FAMILY OF SALAMANDRIDÆ,
 GRAY, INTO TWO FAMILIES, ACCORDING TO THE FORM OF
 THE SKULL. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., PRES.
 ENT. SOC., ETC.

In the Catalogue of Amphibia in the British Museum I placed all the Salamanders which have teeth on the inner side of the hinder edge of the palatal bone together into a single family, under the name of *Salamandridæ*.

Having lately procured the skulls of several of the genera so united, and also examined M. Gervais and M. Dugès' papers in the 'Annals of Natural Sciences,' in which the skulls of several other genera and species are figured, I am now induced to propose to divide the genera into three sections or families thus—

For in a group which offers so few permanent characters for the separation of the genera and species, and which presents such differ-

ent varieties in the form of the dermal appendages, and in the colour of the body in the different seasons of the year, one is very glad to seize on any part which appears to offer a permanent and tangible character :—

Fam. I. SEIRANOTIDÆ.

Seiranotina, Gray, Cat. B. M. 1850, 29.

Skull very depressed, broad; the fronto-temporal arch distinct and united to the bones of the skull (figure 1). Tongue large, hinder half free. Body granular. Palatine bones with a longitudinal series of teeth forming two diverging series, angular in front. Ribs well developed. Vertebrae crested above. Limbs and feet well ossified. Toes 4.4.

1. SEIRANOTA.

Lateral line none. Skin closely and equally granular, granules oblong.

SEIRANOTA PERSPICILLATA (skull, fig. 1).

B.M.

Fig. 1.

Fig. 3.

Fig. 2.



*Seiranota
perspicillata.*



*Spelerpus
rubra.*



*Calatrion
punctulatus.*

Fam. II. PLEURODELIDÆ.

Skull depressed, broad, with a distinct fronto-temporal arch, formed by the union of a process of the frontal and temporal bone. Tongue moderate, attached; hinder and side edges scarcely free. Body granular. Palatine bone, with a longitudinal series of teeth forming two diverging series, angular in front. Ribs well developed. Vertebrae crested above. Limbs and feet well ossified. Toes 4.5.

- a. *Fronto-temporal arch complete. Lateral lines of pore distinct, low down between the axilla and groin.*

2. PLEURODELES.

Ribs exerted, forming a series of spines along the sides. Head and skull depressed, broad. Paratoids distinct.

1. P. WALTII.

Skull, Erp. Gen. t. 101. f. 2.

"*Bradybates ventricosus*, Tschudi, t. 2. f. 1, is perhaps the young."—*Dumeril*. It only differs in the tail being short, perhaps injured.

3. GLOSSOLIGA.

Ribs enclosed. Head and skull very depressed. "Fronto-temporal arch with a separate central bone."—*Gervais*. Paratoid none; lateral pores small, single, in a continuous line.

1. GLOSSOLIGA POIRETI.

B.M.

Erp. Gen. t. 107. f. 1. Skull, *Gervais*, Ann. Sci. Nat. 1853, xx. t. 15. f. 9, & Erp. Gen. t. 102. f. 5, 6.

Forehead flat, with small scattered brown-tipped tubercles. Eyelids distinct, valvular.

N. Africa.

4. NOTOPHTHALMA.

Ribs enclosed. Head and skull rhombic. Forehead with two longitudinal ridges. Tongue oblong. Paratoids none. Cheek with three pits. Hind feet flattened. Tail compressed, keeled, slightly finned often above and below in breeding season.

N. America.

1. N. MINIATA.

B.M.

Skull, Erp. Gen. ix. t. 107. f. 2.

2. N. VIRIDESCENS.

B.M.

Vent in summer produced, truncated, with a rounded series of fringed filaments.

5. CYNOPS.

Tubercular. Head and skull very depressed, broad. Paratoid large, compressed; pores of lateral line small, distant, more distinct near the limbs. Fronto-temporal arch broad, distinct. Ribs enclosed.

1. C. PYRRHOGASTER.

B.M.

Skull, Tschudi, t. 2. f. 5, cop. Schlegel, Fauna Japon. t. 5. f. 7, 8; Cat. Batrach. B.M. t. 3. f. 13.

Japan.

6. TARICHA.

Tubercular. Head and skull depressed, broad. Paratoid large, compressed. Pores of the lateral line small, indistinct, far apart. Vent small. Fronto-temporal arch broad. Skin with conical tubercles. Ribs enclosed.

1. TARICHA TOROSA.

B.M.

Skull, Esch. Zool. Atlas, t. 21. f. 15.
California.

- b. *Fronto-temporal arch complete. Lateral line indistinct, marked with a vessel; ribs enclosed.*

7. CALOTRITON.

Hemitriton, part, A. Dugès.

Head and skull rhombic. Eyelids distinct. Skin smooth, with small black-topped conical warts. Tongue oblong. Paratoids none. Toes free; tips black, rather claw-like. Vent conical.

1. CALOTRITON PUNCTULATUS (skull, fig. 2). B.M.

Hemitriton punctulatus, A. Dugès, Ann. Sci. Nat. xvii. 265. t. 113. f. 1, 2; skull, Dugès, l. c. f. 3 & 18.

Triton puncticulatus, Erp. Gen. ix. 152. t. 106. f. 3; skull, t. 102. f. 4.

8. EUPROCTUS.

Hemitriton, part, A. Dugès.

Head and skull rhombic, depressed. Tongue oblong. Paratoids none. Skin smooth, with scattered small rounded black conic warts. Cloaca produced, conic. Lateral lines of pores none.

1. EUPROCTUS RUSCONII. B.M.

Hemitriton asper, skull, A. Dugès, Ann. Sci. Nat. xvii. t. 113. f. 21, 22.

H. cinereus, skull, Dugès, l. c. f. 14, 15; *H. rugosus*, skull, l. c. t. 1. f. 16, 17, and *H. Bitronii*, skull, t. 1. f. 19, 20, are evidently very nearly allied, if not all the same species.

9. LOPHINUS.

Body smooth. Palatine teeth in two separate series. Orbit in palate small. Fore toes slender, very unequal; the hind toes broad, webbed on each side, the two inner conic. Back three-ridged. Crest of male continued. Lateral lines with distant single pores. Tail of male suddenly truncated before the apex, ending in a filament.

1. LOPHINUS PALMATUS. B.M.

Selys-Longch. Faun. Belg. t. 5. f. 1, 2, good; skull, Dugès, l. c. t. 1. f. 27, 28.

Triton, Wooley; Baker & Deby, Zoologist, 1848, 2149, &c.

Triton minor, Higginbottom, Ann. & Mag. N. II. 1853, xii. 382. t. 16. f. 8, 9.

Lissotriton palmatus, Bell, British Reptiles, second edit. 1849, p. 154 (not of first edition).

"In the season of reproduction the tail of the male is suddenly truncated before the apex and terminated in a slender filament 3 lines in length. The hind feet perfectly palmated, all the toes united by

a membrane (t. 16. f. 8). When the breeding season is over, the slender filament is absorbed, and the truncated portion of the tail becomes obtusely rounded off with a slight indurated dark tip at the end, and the web of the hind feet is wholly absorbed, leaving the toes free (t. 16. f. 9).”—*Higginbottom*.

Mr. Bell admits and figures this species in the second edition of his ‘British Reptiles,’ 1849, p. 154. The figure is not characteristic, as the crest of the male is not sufficiently high, and the coloration is differently disposed from any specimen which has come under my observation.

10. OMMATOTRITON.

Body smooth. Palatine teeth in a crowded series. Orbits in palate large, convex. Crest of male interrupted over the loins. Legs with a membrane on the inner edge. Hands with a subulate tubercle. The hind toes free, very slightly fringed with membranes. Lateral line of pores distinct, single.

1. OMMATOTRITON VITTATUS.

B.M.

Triton vittatus, skull, Dugès, *l. c. t.* 1. f. 29, 30.

England; North of France; Belgium.

Mr. Bell, in his ‘British Reptiles,’ gives a good figure of one of my specimens of this species, which he is convinced “is to be considered as a variety only of the present species”—that is, *Lissotriton palmipes*. The osteological character, as well as the form of the dorsal crest, and the disposition of the colours, shows this is not the case, and that it is not only a distinct species but a very distinct genus, as is further proved by M. Dugès’ figure of the skull.

** *Fronto-temporal arch incomplete, ligamentous behind.*

11. PYRONICIA.

Hemisalamandra, *Hemitriton*, and *Triton*, part, Dugès.

Body slightly tubercular. Hinder toes fringed with a membrane. Back smoothish. Males with a crest. The skull with only a frontal process directed backwards and outwards, the temporal apophysis in the other genera being replaced by a tendinous cord.

1. PYRONICIA MARMORATA.

B.M.

Skull, *Erp. Gen.* t. 106. f. 1.

Hemisalamandra marmorata, Dugès, *Ann. Sci. Nat.* xvii. t. 1. f. 10, 11.

Back marbled, vertebral line pale. Pores of the lateral line distinct, in pairs. Skin smooth, punctulate, subtuberculous.

Oporto.

2. PYRONICIA PUNCTATA.

Triton punctatus, Dugès, *L.c.* t. 1. f. 25, 26; Bell, Brit. Rept. ed. 2.
Triton lævis, Higginbottom, Ann. & Mag. N. H. xii. 380. t. 16.
 f. 6, 7.

Lissotriton punctatus and *L. palmatus*, Bell, Brit. Rept. ed. 1,
 1839 (not Latr.).

Pupils circular, rather larger than those of *T. cristatus*.

The figures of the Smooth Newts (*Lissotriton*) in Mr. Bell's 'British Reptiles' (1839) are so destitute of character, that it is impossible to refer them to the known species with certainty. The figures of *L. punctatus* at pp. 132 and 135, appear to be that species in its winter state; and the figures of *L. palmipes* at p. 139 appear to be intended for the same species in summer, if we regard the disposition of the spots, and the height of the dorsal fin: but the fin is not dentated as it always is in that species, and the toes are not proper for it in its crested state; at the same time it bears no resemblance to the true *T. palmatus*, which has an entire crest; nor has it the filament at the end of the tail, which is always found in the crested form of that species.

In the second edition (1849), Mr. Bell has referred all these figures to *Lissotriton punctatus*, and places the figure which he formerly called *L. palmatus* at the head of the species, p. 143; but it is not characteristic of it, as wanting the dentation on the crest and the broad rounded end fringe of the toes, which are so characteristic of the crested state of the species.

Mr. Bell, believing that the form of the upper lip afforded a good character for the distinction of the species of these animals, divides them into two species, thus—"1. *Lissotriton punctatus*, upper lip straight, not overhanging the lower (p. 132, 138, fig. 2). *Lissotriton palmipes*, upper lip pendulous at the sides, overhanging the under in a distinct festoon as far as the base of the lower jaw. Toes of hinder feet fringed with a short membrane at all seasons." I may observe that the latter is not the *T. palmipes* of Latreille, which has the hind feet of the male in the breeding-season webbed; and that I believe it only differs from the former by being in the fully-developed state at the season of reproduction; and I am borne out in this idea by the observations of Messrs. Higginbottom, Hogg, and many others.

The former observes: "Some *Tritons* have been distinguished by the upper lip overhanging the lower. I have observed that in the first year of *Triton asper* the upper lip overhangs the under considerably at the sides; in the second it overhangs less; between the second and third year it becomes straighter, and in the fourth it overhangs again as much as in the first year. This is also very evident in the *Triton lævis*, in which the same changes take place."—*Ann. & Mag. N. H.* 1853, xii. 375.

"Neither kind of *Triton* is found in the water during the winter months; but they (the brick-makers) discovered great numbers of

them in holes in the clay, and sometimes ten or twelve coiled together. I have observed that either a very wet or very dry situation is fatal to the *Triton* during its state of hibernation, and that a moderately damp one is always chosen for that state of existence; and further, that the *Triton* can live in a solid mass of ice without injury.

“About the last week in March the perfect *Triton* leaves the land and becomes aquatic. It has then acquired all those appearances which exist only during the breeding-season. They are absorbed rather rapidly, and the animal leaves the water in August.

“The *Tritons* of the third and fourth year are found during the cold season in the earth under stones, in clusters of the magnitude of a cricket-ball; those of an earlier period are often found singly at a greater depth under the earth, as before stated.”—p. 381.

12. HEMITRITON.

Body tubercular. Males with a slightly-produced vent. Lateral line none.

1. HEMITRITON ALPESTRIS.

B.M.

Hemitriton alpestris, Dugès, *l. c. t. 1. f. 23, 24*; *Fauna Ital. t. 8. f. 2.*

Fam. III. SALAMANDRIDÆ.

The skull narrow, without any dilation of the frontal or temporal bone to form a fronto-temporal arch. Palate with a longitudinal series of teeth, arched in front. Tongue moderate, attached, hinder and side edges scarcely free. Body granular. Vertebrae rounded. Ribs and bones of limbs and feet imperfectly ossified. Paratoids large, glandular.

* *Lateral lines of pores high up the back, elevated, wart-like.*

1. SALAMANDRA.

Palatine teeth extending before the internal nostrils. Tail roundish. Back not crested.

1. SALAMANDRA ATRA.

B.M.

Skull; Dugès, *l. c. t. 1. f. 8, 9.*

2. SALAMANDRA MACULOSA.

B.M.

Skull, Dugès, *l. c. t. 1. f. 6, 7.*

3. SALAMANDRA CORSICA.

Mouth, Bonap. *Fauna Ital. ii. t. 53* (cop. Dugès, *l. c. t. 1. f. 4, 5*).

** *Lateral line of pores on lower part of side between axilla and groin.*

2. TRITON.

Granular. Tail compressed. Back of male crested. Toes free, simple.

1. TRITON CRISTATUS.

B.M.

Hemisalamandra cristata, skull, Duges, *l. c. t. 1. f. 12, 13* (Erp. Gen. ix. t. 102. f. 2, 3, not sufficiently broad for our specimens).

Triton marmoratus, Bibron, Proc. Zool. Soc. 1838, 23 (not Latr.).

Triton cristatus & *T. Bibronii*, Bell, Brit. Rept. pp. 129, 131, figs.

Pupil small, circular. Tail with a broad pale-bluish longitudinal streak rather below the centre.

M. Bibron, when in London, on observing a specimen of the Warty Newt with straight lips, in the Collection of the Zoological Society, named it *Triton marmoratus*, probably thinking that it was *Triton marmoratus* of Latreille, a species of the South of Europe.

Mr. Bell, in his work on British Reptiles, figures the specimen, and gives it the name of *Triton Bibronii* (pp. 129 & 131, figs.), observing, "it is the same as *Tr. cristatus*, excepting that the upper lip is perfectly straight."

After examining various specimens in different states, I am convinced that the form of the lip depends on the season, the male in the breeding-season having the most overlapping lip.

The same change in the form of the lip in the different seasons is to be observed in *Lissotriton punctatus*.

Mr. J. Higginbottom observes: "The two species of *Triton* (found in the Midland Counties) present such varied appearances during the three years of their slow but progressive growth, and during the changes they experience preparatory to their return from being inhabitants of the land, breathing atmospheric air, active in the summer and hibernant in the winter, to being denizens of the water, reproducing their kind in the months of March, April, May, June and July, that I think they have been regarded by naturalists as presenting too great a number of distinct species."—*Ann. & Mag. N. H.* 1853, xii. 370.

The skulls and skeletons of all the genera of *Molgeæ*, *Plethodontidæ*, *Protonopsidæ* and *Amphiumidæ* I have been able to examine, or which are figured in any works that have occurred to me, resemble those of the family *Salamandridæ*.

Considering the very important characters which the examination of the skulls have shown them to possess for the distinction of the European and Japan species, it is very desirable that the American species should be carefully examined for the same purpose. Up to this time even the description of the palatine teeth of the American species is involved in great uncertainty, the descriptions of Harlan, Holbrook and Baird being often at issue on this important point. It is but just to observe, that when I have had the opportunity of

comparison, I have generally found the description of Dr. Baird the most accurate and trustworthy.

To facilitate this object, I have added a list of the species, the skulls of which have been figured.

Fam. MOLGIDÆ.

MOLGE STRIATA, Gray, Cat. Batr. p. 31. t. 3. f. 111; Schlegel, Fauna Japon. t. 5. f. 9, 10.

Fam. PLETHODONTIDÆ.

ONYCHODACTYLUS JAPONICUS, Gray, Cat. Batr. p. 33. t. 3. f. 1; Fauna Japon. t. 3. f. 6.

AMBYOSTOMA OPACUM, Dum. et Bibr. E. Gén. ix. t. 10. f. 6.

PLETHODON GLUTINOSUM, Tschudi, Batr. t. 2. f. 4.

DESMOGNATHUS FUSCUS.

Plethodon fuscum, Dum. et Bibr. Erp. Gén. t. 101. f. 3. B.M.

SPELERPES RUBRA (skull, fig. 3).

“*Bolitoglossa rubra*, Cab. B.M.” from Paris.

GEOTRITON FUSCUS, sp., Dum. et Bibr. E. G. ix. 112. t. 102. f. 1.

ŒDIPUS VARIEGATUS.

Bolitoglossa mexicana, Dum. et Bibr. Erp. Gén. ix. p. 3. t. 101. f. 4.

ENSATINA ESCHSCHOLTZIA, Esch. Zool. Atlas, t. 22.

6. ON THE POWER OF DISSOLVING SHELLS POSSESSED BY THE BERNARD CRAB (PAGURUS). BY DR. J. E. GRAY, F.R.S., V.P.Z.S., PRES. ENT. SOC., ETC.

In a note to my paper “On the Formation and Structure of Shells,” in the ‘Philosophical Transactions’ for 1833, I stated it is probable that some Bernard Crabs have also the faculty of dissolving shells, for it is not unusual to find the long fusiform shells (such as *Fusus fasciolarus* and *turbinella*) which are inhabited by these animals, with the inner lip and great part of the pillar on the inside of the mouth destroyed, so as to render the aperture much larger than usual.

Having continued my observations on these shells, I am convinced that certain species of Bernard Crab (*Pagurus*) have the power, some possessing it to a much greater degree than others.

Lieut. Burnaby lately brought a number of Crustacea to the British Museum from the South Seas; amongst which there were